REMARKS

This is a full and timely response to the Office Action mailed November 9, 2006, submitted concurrently with a two month extension of time to extend the due date for response to April 9, 2007.

By this Amendment, claims 12, 13, 17, 18 and 21 have been amended to more particularly define the present invention and to overcome the Examiner rejection under 35 U.S.C. §112, second paragraph. Support for the claim amendments can be found throughout the specification and the original claims. Thus, claims 12-15 and 17-21 are pending in this application.

In view of these amendments, Applicant believes that all pending claims are in condition for allowance. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

Information Disclosure Statement

Applicant has provided a English translation of Ninomiya et al. ("An approach towards aminoacylation of tRNA by antisense PNA derivatives," CSJ: The Chemical Society of Japan Koen Yokoshu, Vol. 79, No. 2, Page 873, 1 F3 10 (March 2001)) (citation CB) cited in the Information Disclosure Statement filed March 9, 2005 for the Examiner's review and consideration. Applicant respectfully requests the Examiner to consider the English translation and note such consideration in the next Office Action.

Objection to the Specification

The objection to the specification has been overcome in view of the submission of an amended Sequence Listing in paper and computer readable form in accordance with U.S. practice and Applicant's foregoing amendments to the Brief Description of the Drawings.

Objection to the Claims

The objection to claim 17 has been overcome in view of the Applicant's amendment to the claim. Specifically, the phrase "*consisted of*" has been amended to "*consists of*" as per the Examiner's suggestions. Thus, the withdrawal of this objection is respectfully requested.

Rejection under 35 U.S.C. §112

Claims 12-15 and 17-21 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Applicant believes that this rejection has been overcome by the amendments to the claims. Specifically, the claims have been amended to delete the objected terms (i.e. "*close to*", "*in advance*", "*high*" and "*further*"). Further, with regard to the symbol "H", Applicant believes that the symbol "H" is understandable to one skilled in the art based on the teachings in the disclosure. "H" indicates $-NH_2$ located at the C-terminal of –cAm- which is a cationic amino acid residue (please see Figure 1 of the present application). Thus, in view of the changes to the claims and comments above, withdrawal of this rejection is respectfully requested.

Claims 12-15 and 17-21 are rejected under 35 U.S.C. §112, first paragraph, for allegedly being non-enabling. Applicant respectfully traverses this rejection.

Applicant believes that this rejection is the result of the Examiner's misunderstanding of a certain statement in the present specification. The Examiner states in the Office Action that the instant claims read on both in vivo and in vitro methods since it is stated in the specification that "*it is a matter of course that the method can also be applied to natural amino acids*". Applicant wishes to clarify that the statement cited by the Examiner just means that not only non-natural amino acids but also natural amino acids can be reaction substrates to be introduced to the tRNA in the claimed invention and such introduction is a matter of course.

Applicant believes that in view of the clarification by the Applicants, the Examiner's concerns set forth in the Office Action have been addressed. Thus, withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. §102

Claims 12-15 and 17-21 are rejected under 35 U.S.C. §102(a) as allegedly being anticipated by Ninomiya et al. Further, claims 12-15 and 17-21 are rejected under 35 U.S.C. §102(a) as allegedly being anticipated by Suzuki et al. These rejections have been overcome by the filing of the verified English translation of the certified priority document.

The present application claims priority to Japanese Patent Application 2002-262301, which has a priority date of September 9, 2002. This priority date is prior to the publication dates of Ninomiya et al. and Suzuki et al. Thus, by submitting herewith the verified English translation

and perfecting Applicant's claim for foreign priority, these rejections cannot be sustained and must be withdrawn.

CONCLUSION

For the foregoing reasons, all of the claims now pending in the present application are believed to be clearly patentable over the outstanding rejections. Accordingly, favorable reconsideration of the claims in light of the above remarks is courteously solicited. If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Dated: April 9, 2007

Respectfully submitted,

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 180013 for any such fees; and applicant(s) hereby petition for any needed extension of time.

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An approach towards aminoacylation of tRNA by antisense PNA derivatives

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A purpose of our research is to synthesize in vivo a protein introduced a non-natural amino acid. For the synthesis, the development of an artificial aminoacyl synthetase (ARS) which binds a specific non-natural amino acid to a specific tRNA is important. Such an ARS needs to recognize the specific tRNA and to bind an amino acid to 3'-OH of the tRNA by ester exchange reaction. We report here that the specific recognition of tRNA can be achieved by antisense peputido kakusan (peptide nucleic acid:PNA)derivatives.

PNA derivatives having fluorescein at N-terminal was synthesized by solid-phase method. Identification was carried out by TOF-MS. The purity and the introduction of fluorescent group were confirmed by HPLC. Gel mobility shift assay revealed that the PNS derivatives complementally bound to 3'-terminal of tRNA. On the other hand, PNA derivatives introduced a miss-match mutation did not bind to tRNA. Those results suggest that PNA is suitable to be a recognition site of an ARS which recognizes a specific tRNA. Furthermore, an amino acid was bound to the PNA derivatives as an activated ester in order to give PNA derivatives aminoacylation activity. It is expected that the antisense PNA derivatives transfer an aminoacyl group to tRNA by ester exchange reaction.

Figure: Aminoacylation of tRNA by antisense PNA derivatives